

## CELL CHEMISTRY WORKSHEET

1. What is the most abundant molecule in the cell? .....
2. Name one inorganic molecule in the cell.....
3. What is the difference between inorganic and organic molecules?  
.....
4. Name the 4 different types of organic molecules to be found in the cell.
  - i) .....
  - ii) .....
  - iii) .....
  - iv) .....
5. What is the characteristic of carbon atoms that makes them so versatile?.....
6. Name the 3 atoms that are always found in carbohydrates.....
7. Fats and carbohydrates both contain the same atoms. What distinguishes carbohydrates from fats .....  
.....
8. Give the 3 main functions of carbohydrates.
  - i).....
  - ii) .....
  - iii).....
9. Which of the following is NOT one of the main types of carbohydrate.  
Monosaccharide / Polysaccharide / Sucrose / Disaccharide
10. **Monosaccharides:** (Indicate if true or false)
  - are sweet to taste
  - are insoluble in water
  - provide energy
  - form important structures in the cell or animal
  - are not easily digested in the gut of mammals
  - are found in grains and potatoes
  - are found in fruits and energy drinks
  - include sucrose, maltose and lactose

- can be absorbed into the blood directly from the gut without the need for digestion
- include glucose
- are formed when disaccharides are split

#### 11. **Disaccharides:**

- are sweet to taste
- are soluble in water
- provide energy
- form important structures in the cell or animal
- are not easily digested in the gut
- are found in grains and potatoes
- are found in milk, malt and your sugar bowl
- include sucrose, maltose and lactose
- can be absorbed into the blood directly from the gut without the need for digestion
- include glucose
- are formed when 2 monosaccharides are joined

#### 12. **Polysaccharides:**

- are sweet to taste
- are soluble water
- provide an energy store
- form important structural in the cell or animal
- can be absorbed into the blood directly from the gut without the need for digestion
- are found in grains and potatoes
- include sucrose, maltose and lactose
- do not need to be digested in the gut
- include glucose
- are formed when monosaccharides are joined in long strings
- include cellulose, starch and glycogen

#### 13. **Fats:**

- are soluble in water
- are only soluble in solvents like ethanol
- contain hydrogen and oxygen in the ratio 2:1
- include triglycerides, phospholipids, and some vitamins
- provide the body's most concentrated source of energy
- are formed by the joining of several glucose molecules
- are found in nuts, seeds and dairy produce

14. Give 2 differences between **saturated and unsaturated fats**.

- i) .....
- ii) .....

15. **Proteins:**

- are formed from carbon, hydrogen and oxygen molecules
- all contain nitrogen
- are made up from many fatty acids
- are made up from many amino acids
- are very small molecules
- are very stable molecules and can withstand heating, etc.
- are digested in the gut by the enzymes pepsin, trypsin, peptidases and proteases
- are digested in the gut by amylases
- have a major role in the cell as enzymes
- have a major role in the cell is to provide energy
- are found in cream, potatoes and fruit
- are found in meat, nuts and cheese

16. These statements are true of **amino acids**:

- There are 20 different amino acids
- All of these can be found in plant foods
- The amino acids not found in plants can be made by the body
- Only meat and dairy produce contain all the essential amino acids
- The bond joining amino acids together is called a protein bond

17. Which is the odd one out?

- a) proteins / fats / glucose / carbohydrates / nucleic acids
- b) glucose / starch / amino acids / fatty acids
- c) starch / cellulose / glycogen / glucose
- d) carbon / iron / hydrogen / oxygen
- e) enzymes / plasma membrane / antibodies / plant cell wall

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## ANSWERS

1. H<sub>2</sub>O or water
2. Sodium chloride (NaCl), potassium chloride (KCl), water (H<sub>2</sub>O), oxygen (O<sub>2</sub>) etc.
3. Organic molecules contain Carbon
4. Carbohydrates, fats, proteins, nucleic acids
5. They can bond with 4 other atoms
6. Carbon, Hydrogen and Oxygen
7. In Carbohydrates H and O in ratio 2:1. There is no such relationship in fats.
8. Energy store, energy in cell, structures of the body eg. in cartilage, bone, joint lubricant
9. Sucrose
10. **Monosaccharides** are sweet, provide energy, are found in fruits and energy drinks, do not need to be digested in the gut, include glucose, and are formed when disaccharides are split.
11. **Disaccharides** are sweet, soluble in water, provide energy, are found in milk, malt and your sugar bowl, include, sucrose, maltose and lactose, are formed when 2 monosaccharides are joined.
12. **Polysaccharides** are soluble in water (glycogen only) provide an energy store, form important structural molecules, are not easily digested in the gut, are found in grain and potatoes, are formed when monosaccharides are joined in long strings and include cellulose, starch and glycogen.
13. **Fats** are only soluble in solvents like ethanol, include, triglycerides, phospholipids, and some vitamins, are the body's most concentrated form of energy, are found in nuts, seeds and dairy produce.
14. **Saturated fats** contain the maximum number of hydrogen atoms, come from animals, and tend to be soluble at room temp. **Unsaturated fats** can incorporate more hydrogen into their structures, come from plants and fish (and poultry) and tend to be liquid at room temperature.
15. **Proteins** are formed from carbon, hydrogen, oxygen and **nitrogen** atoms, are made up of many amino acids, are digested in the gut by pepsin, trypsin and peptidases, their major role in the cell is as enzymes, and they are found in meat, nuts and cheese.
16. **Amino acids**. There are 20 different amino acids, all of which can be found in meat and dairy produce in the correct quantities. Plant protein may lack one or more essential amino acids. The bond joining amino acids is called a peptide bond.

17. a) Glucose- is a monosaccharide, all the rest are major nutrient groups  
b) Starch is a polysaccharide - all the rest are the building blocks of the major nutrients  
c) Glucose—all the rest are polysaccharides  
d) Iron—not a common atom in organic molecules  
g) Plant cell wall which is made of cellulose - all the rest are proteins